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About This Document

Purpose

This document provides the positioning, features, networking schemes, and technical specifications of the HUAWEI TE60 videoconferencing endpoint (TE60 or endpoint for short).





Intended Audience


This document is intended for:

- End users
- Agents

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.

Symbol	Description
 NOTE	<p>Calls attention to important information, best practices and tips.</p> <p>NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.</p>

Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in earlier issues.

Issue 04 (2018-06-30)

This issue is the fourth official release.

Add [5.16 Custom Background Picture](#).

Modified [5.6 Multi-View](#).

Issue 03 (2018-03-23)

This issue is the third official release.

Added [5.13 AirPresence Key](#).

Added [6.6 CHR Collection](#).

Modified [4.2 Front Panel and Rear Panel](#).

Modified [5.1 Intelligent Tracking](#).

Issue 02 (2018-02-05)

This issue is the second official release.

Modified [4.2 Front Panel and Rear Panel](#).

Issue 01 (2017-12-25)

This issue is the first official release.

Contents

About This Document.....	ii
1 Product Positioning.....	1
2 Product Highlights.....	2
3 Application Scenarios.....	5
3.1 On-Premises/IMS Hosted/SP Hosted Network.....	5
3.2 Built-in MCU-based Network.....	5
3.3 Built-in MCU Networking with the RSE6500.....	7
3.4 Videxio Interconnection Network.....	8
3.5 Networking with the ACS.....	8
4 Product Structure.....	10
4.1 Appearance.....	10
4.2 Front Panel and Rear Panel.....	10
4.3 Checking Indicator Status.....	14
4.4 Intelligent Camera.....	15
5 Functions and Features.....	16
5.1 Intelligent Tracking.....	16
5.2 Voice Dialing.....	17
5.3 SiteCall.....	18
5.4 P2P to Multipoint.....	18
5.5 Conference Control.....	19
5.6 Multi-View.....	21
5.7 Screen Layout Adjustment.....	21
5.8 Simultaneous Transmission of Video and Presentation.....	22
5.9 Multi-Language User Interface.....	22
5.10 Conference Recording.....	23
5.11 Wi-Fi Connectivity.....	23
5.12 Wireless Data Sharing.....	24
5.13 AirPresence Key.....	25
5.14 Automatic Configuration Via a USB Device.....	25
5.15 Startup Video Customization.....	25
5.16 Custom Background Picture.....	26


5.17 Network Address Book.....	26
5.18 Real-time Viewing of HD Images.....	26
5.19 Adaptation of and Conversion Between the 16:9 and 4:3 Display Modes.....	27
5.20 VGA Bypass.....	27
5.21 Microphone Array Cascading.....	27
5.22 Seamless Convergence with IMS and USM.....	27
5.23 Registering with the SC Using the Same SIP Number as the TE Desktop&TE Mobile.....	28
5.24 Interworking with the Lync System.....	28
5.25 Interconnection with the Videxio.....	28
5.26 Interconnection with the ACS.....	28
5.27 Interconnection with the BroadSoft Platform.....	28
5.28 Interconnection with the DDNS.....	29
5.29 PSTN.....	29
5.30 4E1.....	29
5.31 Third-Party APIs.....	29
5.32 Network Adaptability.....	29
5.33 Security.....	30
6 Operation and Maintenance.....	33
6.1 Using the Touch Panel.....	33
6.2 Using the Remote Control.....	34
6.3 Using the Web Interface.....	34
6.4 Log Management.....	35
6.5 Inspection.....	35
6.6 CHR Collection.....	35
6.7 System Upgrade.....	36
6.8 Disaster Recovery.....	36
7 Technical Specifications.....	37
7.1 Physical Specifications.....	37
7.2 Performance and Capacity.....	38
7.3 Ports and Protocols.....	40
7.4 Standards Compliance.....	42
A Glossary.....	44

1 Product Positioning

The TE60, an HD videoconferencing endpoint ideal for kinds of conference rooms, supports H.264 Scalable Video Coding (SVC), H.264 HP, IPv4 and IPv6 as well as Wi-Fi.

Table 1-1 describes the appearance, features, and application scenarios of the TE60.

Table 1-1 Appearance, features, and application scenarios of the TE60

Appearance	Feature	Application Scenario
	A maximum of 1080p 60 fps is supported. The TE60 supports 4E1 HD networking and outperforms the TE40 and TE50 in the dual-stream and built-in MCU capabilities.	Large-sized conference rooms

2 Product Highlights

Next-Generation H.264 HP and VME Dual-Core Technologies

- Dual streams (video + presentation) of up to 1080p 60 fps are supported.
- The H.264 HP technology, combined with Huawei's proprietary Video Motion Enhancement (VME) technology, optimizes video images to be more pleasing to eyes while reducing the bandwidth consumption by 50%.
- Through intelligent face recognition and back-end video enhancement, the VME technology improves light adaptability, reduces bandwidth consumption, improves image definition, and enhances motion images.
- The endpoint provides users with high-fi audio using MPEG-4 Low Delay Audio Coder (AAC-LD), acoustic echo cancellation (AEC), and automatic noise suppression (ANS) technologies.

Feature-rich, Intelligent, and Easy to Use

- New participants can be directly added to an active P2P or multipoint call, facilitating smooth communication.
- The endpoint and TE Desktop&TE Mobile can be registered using the same SIP number, so fewer numbers are required.
- With the voice dialing function, users can quickly initiate or join a conference by speaking the name of a site in Chinese or English.
- Without any intervention of the MCU, the local endpoint can combine video captured by several cameras and send the video to the remote endpoint as continuous presence, which meets the requirements of viewing a site from every angle and reduces the bandwidth usage.
- The endpoint with a built-in Wi-Fi module can connect to a Wi-Fi network, serve as a Wi-Fi hotspot, or both.
- The endpoint allows multiple sites to simultaneously share content in Live mode at 1080p 60 fps. Other sites select the shared content to view on demand.
- The wireless data sharing client is provided for connecting a PC to the endpoint over Wi-Fi. Then you can use the client to easily share the PC desktop as well as files stored on the PC.

- The AirPresence mobile client can be installed on a mobile device and paired with the endpoint through the projection code. Then you can use the AirPresence mobile client to push content on the mobile device to the endpoint.
- The endpoint can automatically import configuration data from a USB flash drive, without any manual intervention.
- VGA loopback is supported. You can connect your PC to the endpoint and then connect the endpoint to a projector. Then you can directly push the PC desktop to the projector when the endpoint is shut down, without plugging and unplugging cables.

User Interface Easily Operated Using the Remote Control

- The remote control has a compact design and integrates the most commonly used buttons.
- A touch panel can be used if necessary.
- A wizard is provided to help you easily complete the installation.
- The 3D user interface is available and different modules are visible to users of different roles. You can use the remote control to initiate calls or join conferences from the user interface.
- The LCD screen on the endpoint shows the local site information (including the IP address and number) in real time.

High Network Adaptability and Security

- Using H.264 SVC, the endpoint excellently adapts to different line bandwidths, device capabilities, and network environments.
- The endpoint utilizes Huawei's exclusive Super Error Concealment (SEC) and Intelligent Rate Control (IRC) technologies.
- The endpoint supports firewall traversal through the standard H.460 protocol or Huawei's proprietary Super Network Passport (SNP) protocol.
- Media and signaling streams are encrypted in multiple ways, ensuring secure and stable running of the videoconferencing system.

Extensive System Integration

- The endpoint can interwork with industry's mainstream standard endpoints, infrastructures, the IP Multimedia Subsystem (IMS), the BroadSoft platform, and the Videxio cloud videoconferencing platform (referred to as Videxio platform hereinafter), delivering an intelligent, easy-to-use conference experience.
- The endpoint can be seamlessly integrated into the IMS or SP hosted network.
- The endpoint can interwork with Microsoft Skype for Business (next-generation Lync client), Lync 2013/2010, and Lync Online (Office 365) through the Lync gateway or PXP Integrated Media Server.
- The endpoint is the industry's first videoconferencing endpoint that enables you to schedule or start a multipoint video conference as easily as making a call.
- The endpoint provides rich APIs for third parties to facilitate system integration and customization.
- endpoints connected to the same third-party Dynamic Domain Name System (DDNS) can call each other by domain name.

(Optional) Built-in MCU

The endpoint with the built-in MCU can hold multipoint conferences without any intervention of the SMC or standalone MCU.

This enables users to call multiple sites one by one, or use a predefined conference template to call multiple sites at a time. After a conference starts, sites can dial the number or IP address of the endpoint that houses the built-in MCU to join in the conference.

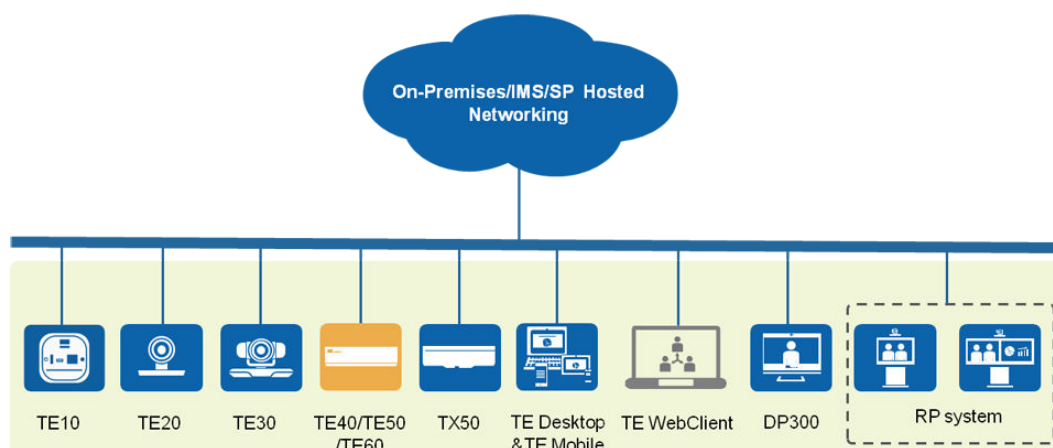
- Maximum connected sites allowed by a non-encrypted conference: 9 720p 30 fps video sites (local site included) + 3 audio sites
- Maximum connected sites allowed by an encrypted conference: 9 720p 30 fps video sites (local site included)
- Maximum bandwidth required for a conference: 8 Mbit/s (1 Mbit/s for each video site)
- One conference can be simultaneously joined by different types of endpoints, including SD terminals, HD terminals, VoIP terminals, H.323 terminals, SIP terminals, and terminals supporting different audio and video formats and bandwidths.
- Continuous presence per port: supports a maximum of 10 video panes.
- Supports rich functions, including voice activation, floor request, dual-stream transmission through H.239, and Binary Floor Control Protocol (BFCP), and can collaborate with the Huawei RSE6500 to support multipoint conference recording, meeting the requirements of small- and medium-sized enterprises in terms of equipment price and maintenance costs.
- Adds local video and presentation to continuous presence.

3 Application Scenarios

3.1 On-Premises/IMS Hosted/SP Hosted Network

The endpoint connects to on-premises, IMS hosted, or SP hosted CloudVC/CloudEC networks, enabling video communication for enterprises and carriers. [Figure 3-1](#) shows the network diagram.

Figure 3-1 Networking diagram



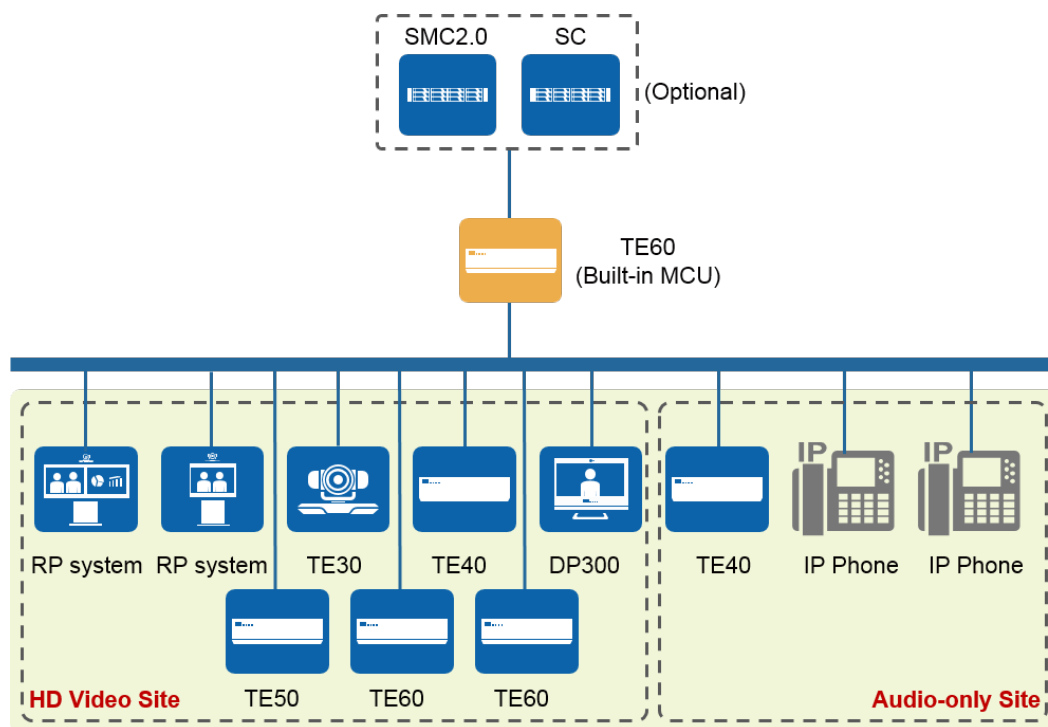
The network is described as follows:

- The endpoint connects to the on-premises network through the standard SIP or H.323 protocol.
- The standard SIP protocol is used for connecting the endpoint to the IMS or SP hosted network.
- Video, data, and presentation sharing can be implemented between the endpoint and various kinds of terminals and clients to deliver the optimal communications experience.

3.2 Built-in MCU-based Network

In the CloudVC on-premises networking scheme, the endpoint TE60 can hold multipoint conferences using its built-in MCU, without any intervention of the SMC2.0 or MCU. The built-in MCU makes conference rooms of small- and medium-sized enterprises video-enabled. **Figure 3-2** shows the built-in MCU-based network of the endpoint.

Figure 3-2 Built-in MCU-based network



The network is described as follows:



- After having the built-in MCU enabled, the endpoint TE60 can hold both encrypted and unencrypted conferences.
 - An unencrypted conference can hold a maximum of eight 720p 30 fps HD video sites and three audio sites, besides the site that initiates the conference. Each video site occupies 1 Mbit/s bandwidth. The total bandwidth occupied by the conference cannot exceed 8 Mbit/s.
 - An encrypted conference can hold a maximum of eight 720p 30 fps HD video sites, besides the site that initiates the conference. Each video site occupies 1 Mbit/s bandwidth. The total bandwidth occupied by the conference cannot exceed 8 Mbit/s.

- SD and HD video sites and audio-only sites of the H.323 or SIP type can join conferences on this network.

NOTE

Audio-only sites can join conferences using IP phones only when the SC is deployed on the network.

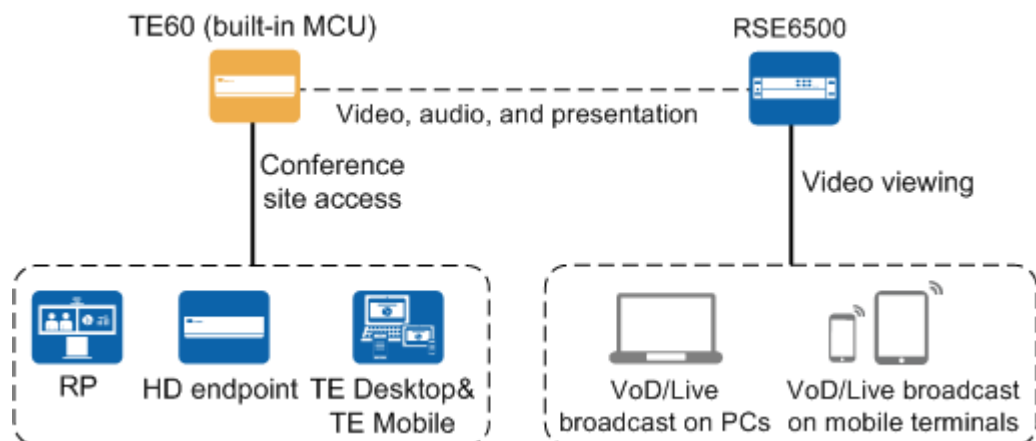
- This network supports presentation sharing through the H.239 protocol, as well as simultaneous video and presentation sharing through the Binary Floor Control Protocol (BFCP).

- When a site joins a conference, the endpoint automatically adjusts the continuous presence layout to display the video of that site. For example, when there are only two video sites, the continuous presence layout is 2-pane . If a third video site joins in, the continuous presence layout is automatically adjusted to 3-pane . The site that generates the loudest volume is displayed in the largest pane. The local site is not displayed by default.
- The endpoint with a built-in MCU provides conference control functions, including requesting or releasing chair control rights, allowing or forbidding the chair site, locking or unlocking a conference, and selecting a screen layout.

3.3 Built-in MCU Networking with the RSE6500

In the CloudVC on-premises network, the endpoint TE60 that has a built-in MCU can be separately interconnected with the Recording & Streaming Engine (RSE), without the intervention of the SMC2.0 or MCU. [Figure 3-3](#) shows how the endpoint TE60 with the built-in MCU is networked with the RSE6500.

Figure 3-3 Built-in MCU networking with the RSE6500



The network is described as follows:

- The MCU-embedded endpoint is deployed on the same IPv4 or IPv6 network as the RSE6500. It can contact the RSE6500 using the IP address.
- The MCU-embedded endpoint exchanges media streams with the RSE6500 to implement simultaneous recording of conference voice, video, and presentation. Recording control can be performed on either the endpoint or the RSE6500.
- Users can view live broadcast or VoD either from the endpoint web interface or from the RSE6500 web interface on their PCs, smartphones, or tablets.

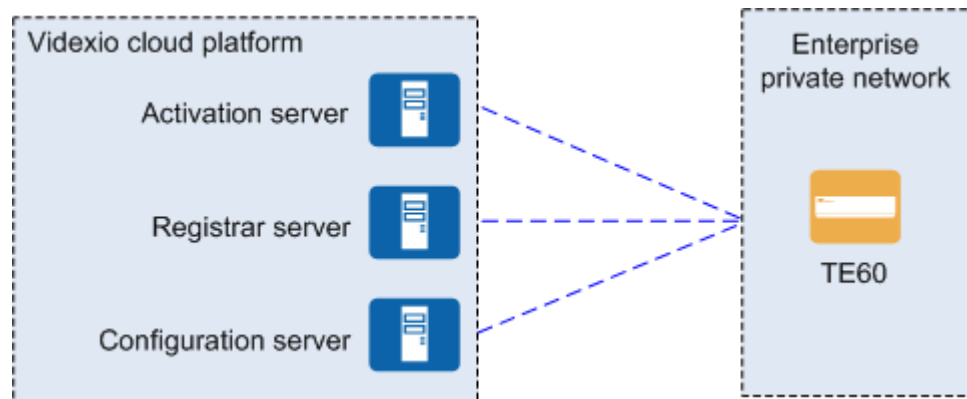
 **NOTE**

On this network, the endpoint with the built-in MCU works with the RSE6500 in the simplest way. Without any intervention of the GK or SIP server, they are connected by their IP addresses.

3.4 Videxio Interconnection Network

To interconnect your endpoint with the Videxio platform, click the activation button on the Videxio web page and choose to automatically scan your endpoint or manually search for your endpoint by IP address. **Figure 3-4** shows the network where the endpoint is interconnected with the Videxio platform.

Figure 3-4 Videxio interconnection network



The network is described as follows:

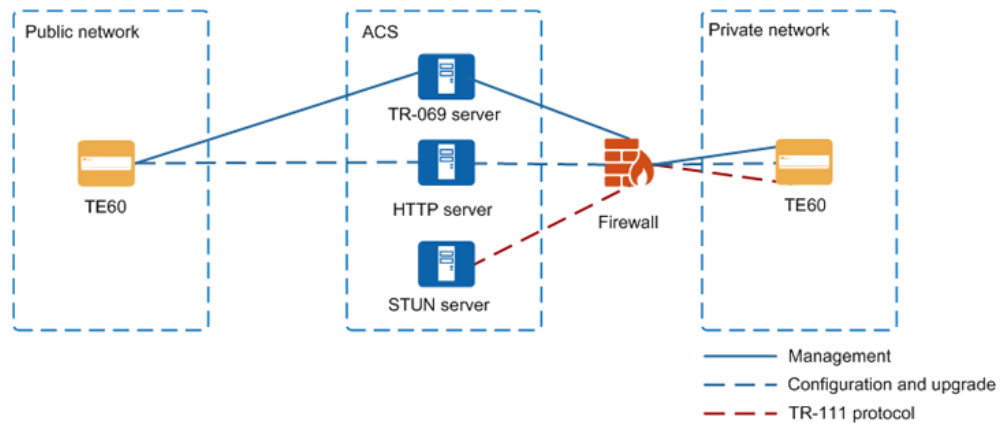
- By interacting with the activation server, registrar server, and configuration server on the Videxio platform, the endpoint gets activated, obtains SIP configuration data, acquires its own site name, and automatically registers with the Videxio platform based on the obtained data.
- The endpoint communicates with the Videxio platform only through the SIP protocol to get registered and convene conferences.
- For video conferences that are held on the Videxio cloud videoconferencing platform, only presentation sharing is supported.

3.5 Networking with the ACS

The endpoint can interconnect with the Auto-Configuration Server (ACS) to implement management functions through the TR-069 service offered by the ACS.

Figure 3-5 shows the interconnection between the endpoint and the ACS.

Figure 3-5 Interconnecting with the ACS



On this network:

- The endpoint communicates with the TR-069 server through the TR-069 protocol.
- The HTTP server is used to upload and download configuration files and download upgrade files.
- The Simple Traversal of UDP through NAT (STUN) server implements traversal between private and public networks and delivers management over all devices on both networks.
- The endpoint can be deployed on a public or private network, while the ACS must be deployed on a public network.
 - If the endpoint is deployed on a public network, it can be managed by the ACS through the TR-069 protocol.
 - If the endpoint is deployed on a private network, the STUN server needs to be deployed for traversal between private and public networks. After the deployment, the TR-111 protocol, an extension of the TR-069 protocol, will be available for the ACS to manage the endpoint.

4 Product Structure

4.1 Appearance

Its all-metal shell feels durable and shows the quality of the product.

Figure 4-1 Appearance



4.2 Front Panel and Rear Panel

Figure 4-2 shows the front panel. **Figure 4-3** shows the ports on the rear panel, and **Table 4-1** provides the detailed description of these ports. For details about the status of the indicators, see **4.3 Checking Indicator Status**.

Figure 4-2 Front panel



No.	Component	Description
1	OLED display	Displays the IP address, site number, and indications for startup, upgrade, sleep, and malfunction.
2	Alarm indicator	Turns on when an alarm is generated.
3	Status indicator	Indicates the endpoint status, such as running and standby.

NOTE

Ports on the real panel may slightly differ for the endpoints of different batches.

Figure 4-3 Rear panel

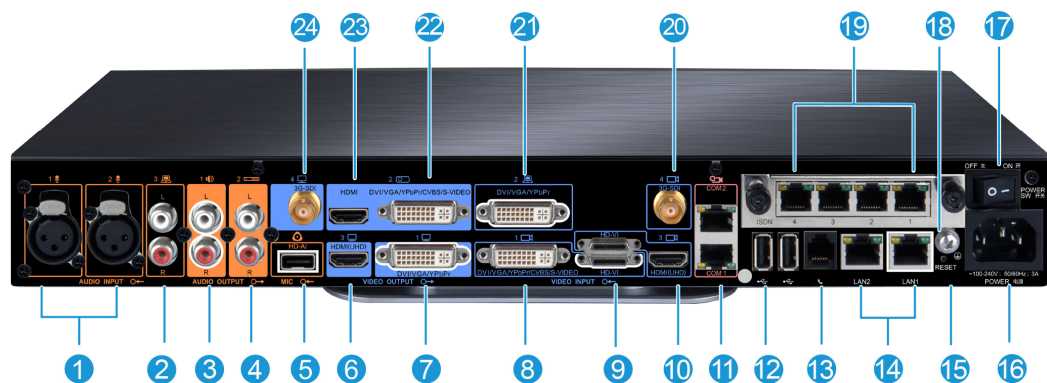


Table 4-1 Port description

Port Type	No.	Description	Function
Audio input	1	Microphone input port, that is, XLR port	Connects the XLR port on a microphone for audio collection and input at a site.
	2	RCA port ● L: left audio channel ● R: right audio channel	Connects to an audio input source, such as a computer or mobile phone.

Port Type	No.	Description	Function
	5	Microphone array port	Connects to a microphone array, for example, HUAWEI VPM220.
Audio output	3	RCA port <ul style="list-style-type: none"> ● L: left audio channel ● R: right audio channel 	Connects to an external speaker as a Line 1 port. It is a reserved audio output port. Connects to the 3.5 mm audio input port on the Huawei VPT300 intelligent camera.
	4	RCA port <ul style="list-style-type: none"> ● L: left audio channel ● R: right audio channel 	Connects to a recording device as a Line 2 port, and records sounds of the local and remote sites. Connects to the 3.5 mm audio input port on the Huawei VPT300 intelligent camera.
Video input	8	DVI-I port, which supports: <ul style="list-style-type: none"> ● HD input: DVI or VGA ● SD input: CVBS or S-Video 	Connects to the main camera for local video input (as the first input).
	9	Proprietary camera port, which consists of two layers	Connects to two cameras (two VPC620s, two VPT300s, or one VPC620 and one VPT300) for video input. <ul style="list-style-type: none"> ● The port at the lower layer connects to the main camera for local video input (as the first input). ● The port at the upper layer connects to a secondary camera (as the third input).
	10	HDMI port, which supports a resolution of up to 1080p 60 fps	Connects to a secondary camera or presentation source as the third input.
	20	3G-SDI port, which supports SDI signal input, the 3G-SDI standard, and a resolution of up to 1080p 60 fps	Connects to a secondary camera as the fourth input. The 3G-SDI port is connected to Huawei's coaxial cable to support a maximum transmission distance of 60 m.
	21	DVI-I port, which exports DVI, VGA, or YPbPr signals	Connects to a presentation source, such as a computer, as the second input.

Port Type	No.	Description	Function
Video output	6	HDMI port, which exports HDMI signals and supports a resolution of up to 1080p 60 fps	Connects to a presentation output device as the third output.
	7	DVI-I port, which exports DVI, VGA, or YPbPr signals	Connects to a device for displaying video of the local site as the first output.
	22	DVI-I port, which supports: <ul style="list-style-type: none">● HD output: DVI or VGA● SD output: CVBS or S-Video	Delivers the shared presentation or video of the remote sites by default as the second output.
	23	HDMI port, which exports HDMI signals and supports a resolution of up to 1080p 60 fps	
	24	3G-SDI connector, which supports the 3G-SDI standard and a resolution of up to 1080p 60 fps	Connects to a display device as the fourth output. The 3G-SDI port is connected to Huawei's coaxial cable to support a maximum transmission distance of 60 m.
Miscellaneous	11	Dual-mode serial communication port	Connects to a camera control cable and can be used for diagnostics and maintenance.
	12	USB port x 2	Connects to a USB device, such as a removable hard disk, USB flash drive, or data card.
	13	PSTN port	Connects to a PSTN cable. Currently, this port can be used in China only.
	14	10 Mbit/s, 100 Mbit/s, or 1000 Mbit/s full duplex Ethernet ports, which support IP network transparent transmission and network port backup	<ul style="list-style-type: none">● LAN1: functions as the main network port.● LAN2: is used for transparent transmission and network port backup.
	15	Reset button	<ul style="list-style-type: none">● When the endpoint is powering on, press and hold this button for 10s to enter the mini system.● When the endpoint is running, press and hold this button for 10s to reset the endpoint to factory settings.

Port Type	No.	Description	Function
	16	Power input port (100 - 240 V AC, 50 Hz to 60 Hz)	Connects to a power supply.
	17	Power switch	Powers on or off the endpoint.
	18	Grounding port	Connects to a ground cable.
	19	4E1 port	Accommodates a 4E1 interface card for 4E1 communication. Whether a 4E1 interface card is available depends on your requirements.


4.3 Checking Indicator Status

By checking the status of indicators on an endpoint, you can know its running status and ensure that it works well with other videoconferencing devices.

When all cables are connected correctly, connect the TE60 to a power supply and turn the power switch to ON.

Table 4-2 describes the TE60 indicator status.

Table 4-2 TE60 indicator status

The Indicator Is...	The Endpoint Is...
Off	Disconnected from the power supply.
Blinking blue twice per second	Powering on.
Steady blue	Working properly.
Steady purple	Powered off. (Press  on the remote control to power off the TE60.)
Blinking green (on for 1s, off for 2s)	Standby.
Blinking blue four times per second	Upgrading.
Blinking blue once	Responding to a press on a remote control button. (The TE60 responds to remote control operations only when working properly.)
Blinking red twice per second	Overheated.

The Indicator Is...	The Endpoint Is...
Blinking red four times per second	Encountering a temperature fault. For example, the temperature sensor inside the endpoint cannot sense the operating temperature, causing fast fan rotation speed and loud fan noise.
Steady red	Faulty.

4.4 Intelligent Camera

The endpoint connects to one or two Huawei VPT300 intelligent cameras as shown in [Figure 4-4](#).

Figure 4-4 Intelligent camera VPT300



The VPT300 has a compact design and consists of one base, one sound pickup pole, and two VPC600s. Besides, the VPT300 provides 16 built-in microphones as a microphone array to detect sound and locate the sound source using a function known as sound localization. The VPT300 also provides a dual-camera system for face detection and video location. In a word, the VPT300 supports speaker tracking with accurate localization and fast focus.

5 Functions and Features

5.1 Intelligent Tracking

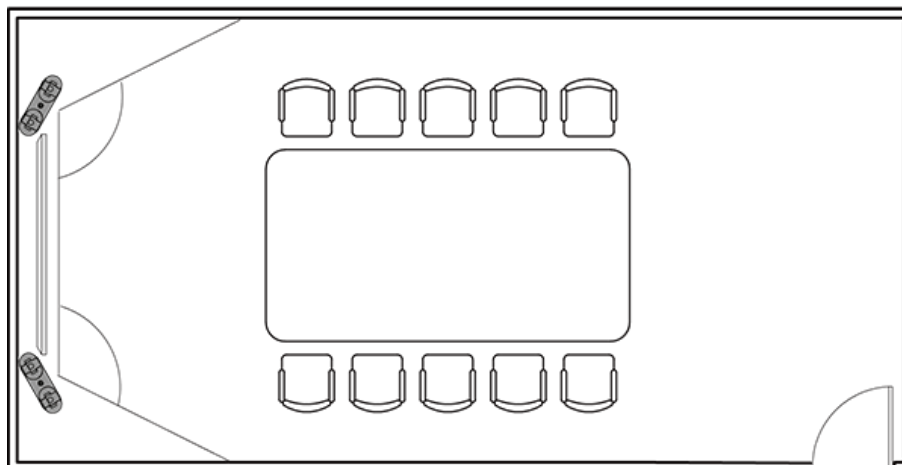
The endpoint connects to one or two Huawei VPT300 intelligent cameras to provide the Voice Activity Detection (VAD) and facial recognition functions. Additionally, the speaker tracking function of the VPT300 can be configured through the endpoint.

The VPT300 has the following features:

- In automatic tracking mode, the VPT300 automatically detects and identifies the conference status, takes panoramic and close-up video images, and track speakers. The VPT300 also supports PiP to present the optimal view.
 - The VPT300 takes close-up video images of the speaker when only one participant speaks or multiple participants speak one by one.
 - The VPT300 automatically detects two participants who are having a conversation and displays their video images separately in two panes.
 - When no one is speaking, the VPT300 automatically adjusts the focal length based on the number of participants detected to display the panoramic view of all participants in the conference room.
 - The VPT300 displays panoramic and close-up video images in PiP mode. When a participant is speaking, the VPT300 displays the panoramic view in full-screen mode and the close-up video of the speaker in a small window at any of the four corners. When the participant stops speaking, the small window disappears.
- In AutoFrame mode, the VPT300 automatically adjusts its dual cameras based on the number and positions of participants in the conference room to take the optimal panoramic view.
- You can also pan or tilt the camera using the remote control.

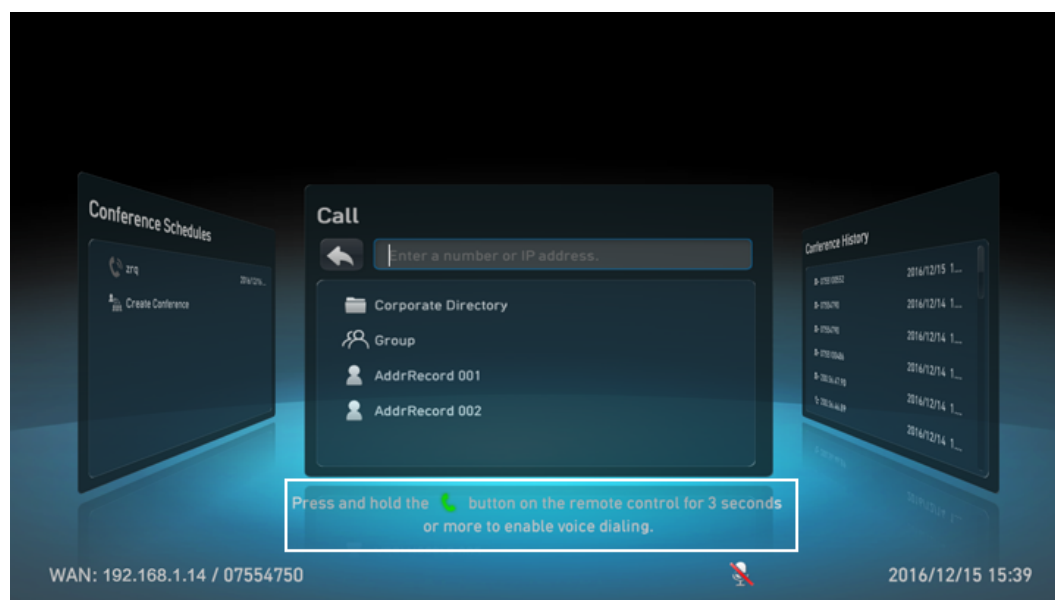
Two VPT300s can connect to one endpoint and function like only one VPT300 to capture better speaker views.

The two VPT300s are separately installed on both sides of the display, as shown in [Figure 5-1](#).

Figure 5-1 Locations of the two VPT300s

5.2 Voice Dialing

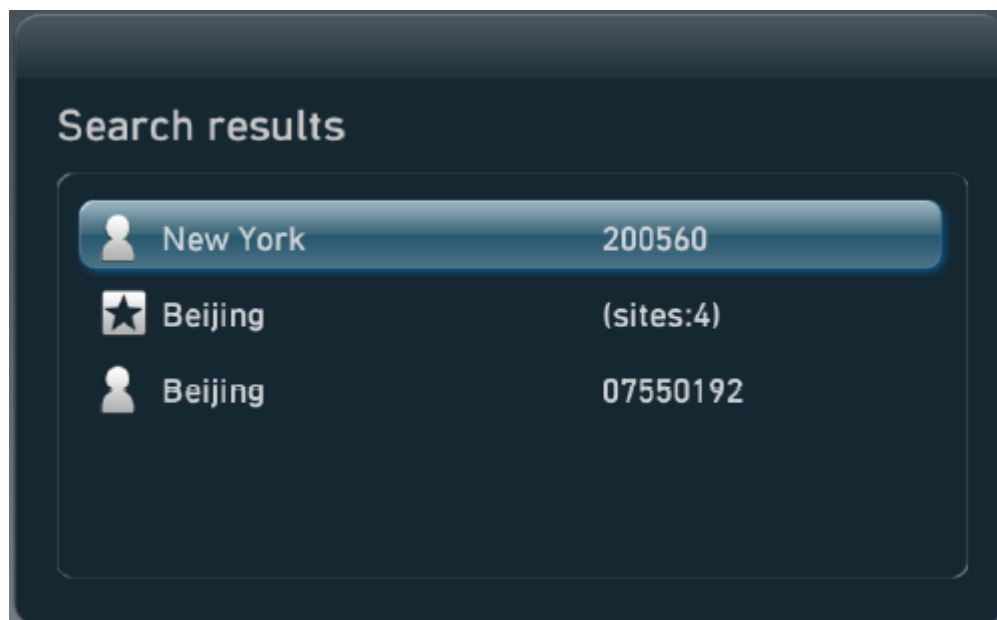
The endpoint uses speech recognition technology to support point-to-point voice calls on the remote control screen in both Chinese and English, and also allows users to initiate multipoint conferences through templates. The endpoint can recognize site names, conference names, and names of predefined conferences. It can automatically call sites to join conferences or initiate SiteCalls to initiate conferences, simplifying user experience. **Figure 5-2** shows the **Call** window.

Figure 5-2 Voice dialing

If there is only one site shown in the list after voice dialing is made, then a call is initiated automatically.

If there are two or more sites displayed in the list, users can choose one to make a call, as shown in [Figure 5-3](#).

Figure 5-3 Voice dialing list



5.3 SiteCall

SiteCall is a unique conference function provided by Huawei. It allows users to define conferences and participants on the endpoint, making it simple to initiate a multi-party conference. Users can create conferences using the touch panel, web interface, or remote control of the endpoint. After setting conference parameters (such as the conference name, data rate, and number of sites), the users can start the conference. The endpoint can initiate conferences through H.323 or SIP.

5.4 P2P to Multipoint

When the endpoint is connected to an MCU, you can turn a P2P call into a multipoint call, increasing conference efficiency. Below are different scenarios where this may be necessary.

Local Site Receiving Calls from Other Sites

If two sites are having a P2P call and one of the sites receives another incoming call (or multiple incoming calls), that site can perform one of the following operations:

- **Answer&Merge:** Answer calls from other sites and turn the P2P call into a multipoint conference.
- **Answer&Hold:** Answer calls from other sites and place the original P2P call on hold. Then you can place calls on hold or merge calls as follows:

- Call Hold: The site in an active call can be placed on hold or released, and the site on hold can be resumed off hold or released. In call hold state, the local and remote sites cannot hear or video each other. They can do this only after the call hold operation is canceled.
- Merge: Place the original P2P call on hold, and set up a call with another site or to several other sites, and turn the P2P call into a multipoint conference.
- Answer&Release: Answer calls from other sites and release the original P2P call.
- Ignore: Ignore calls from other sites, close the incoming call notification dialog box, and continue the original P2P call.
- Reject: Reject calls from other sites and continue the original P2P call.

Local Site Placing Calls to Other Sites

If two sites are having a P2P call and one of the sites calls another site (or multiple sites), that site can perform one of the following operations:

- Hold&Call: Place the original P2P call on hold and place a call to another site or to several other sites.

Then you can place calls on hold or merge calls as follows:

- Call Hold: The site in an active call can be placed on hold or released, and the site on hold can be resumed off hold or released. In call hold state, the local and remote sites cannot hear or video each other. They can do this only after the call hold operation is canceled.
- Merge: Place the original P2P call on hold, and set up a call with another site or to several other sites, and turn the P2P call into a multipoint conference.
- Add: Add sites to the original P2P call to turn it into a multipoint conference.
- Cancel: Cancel calling another site or several other sites and continue the original P2P call.

5.5 Conference Control

Conference control enables a more flexible and functional conference system. Conference control can be performed by the chair or by the non-chair site. The chair site can perform a diverse range of practical conference control operations, while the non-chair site can perform some simple conference control operations.

NOTE

For the endpoint that joins a conference initiated by the Videxio platform, conference control functions are unavailable.

The chair site can perform conference control operations on the touch panel UI (see [Figure 5-4](#)), remote control UI ([Figure 5-5](#)), and web interface (see [Figure 5-6](#)).

Figure 5-4 Conference control on the touch panel UI

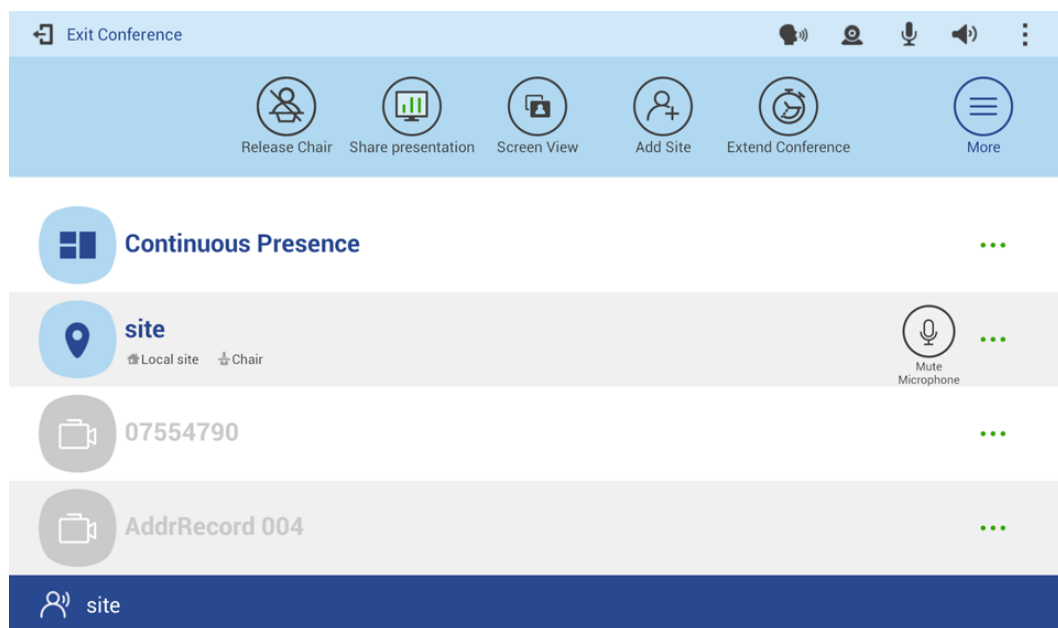


Figure 5-5 Conference control on the remote control UI

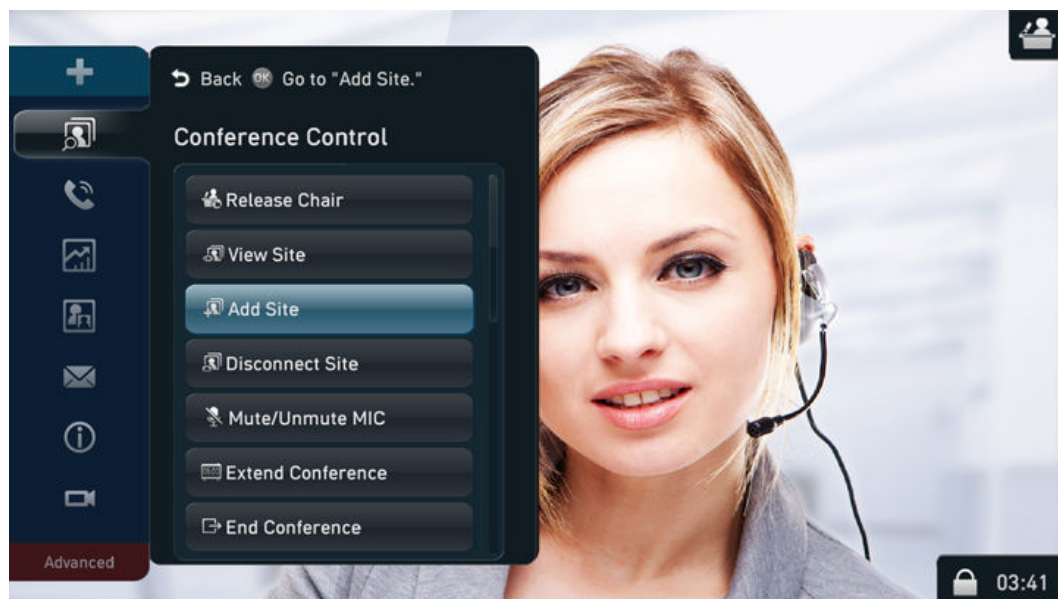
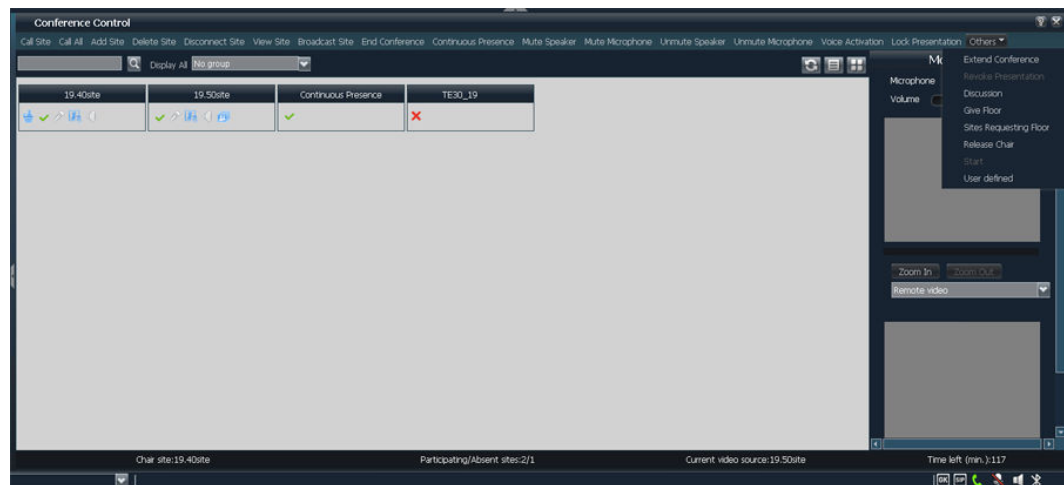


Figure 5-6 Conference control on the web interface

5.6 Multi-View

The endpoint is able to combine two or more local inputs and share them as video or content over one channel with remote participants. The inputs can be video captured by the camera or the PC desktop. The multi-view mode can be configured even during a conference and takes effect immediately.

The multi-view layout can be Picture in Picture (PiP), 2-pane, or 3-pane modes. In PiP mode, the PiP window can be in the upper left, upper right, lower left, or lower right corner. One input can be configured to show in one or more panes, but the input cannot be a remote video source.

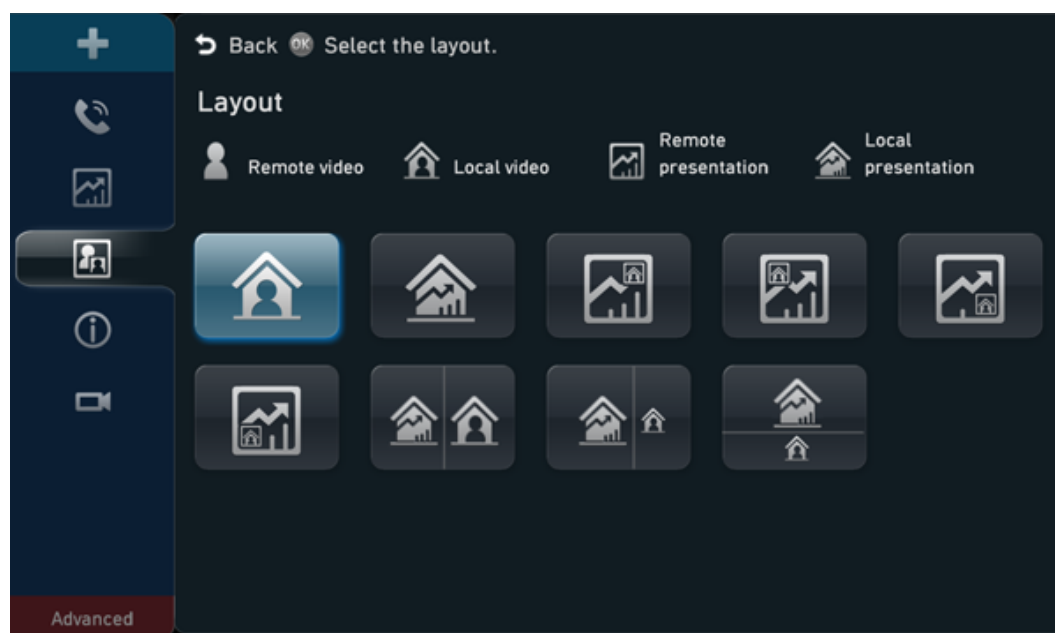
5.7 Screen Layout Adjustment

By adjusting the screen layout, you can view multiple channels of video on the same monitor.

The screen layout can be full-screen, PiP, 2-pane, and 3-pane.

- Full-screen: Only one channel of video or presentation is available, and it is displayed in full-screen mode.
- PiP: One channel of video is displayed in full-screen mode, and at the same time, another channel of video is displayed in an inset window that can appear in any corner of the display. By default, the smaller video is displayed in the lower right corner and is approximately 1/16 of the full-screen video.
- 2-pane: Users view two sites on a single monitor in two panes. The two panes are of the same size and can display video or presentation.
- 3-pane: Users view three sites on a single monitor in three panes. Each pane is about 1/3 of the screen and can display video or presentation.

Figure 5-7 shows some sample layouts.

Figure 5-7 Sample screen layouts

5.8 Simultaneous Transmission of Video and Presentation

The endpoint can simultaneously send video and content in P2P and multipoint conferences. It perfectly combines motionless shared content with motional video of participants to deliver immersive conference experience. Additionally, the endpoint can simultaneously send two channels of local video or receive two channels of remote video.

The endpoint shares content in Presentation or Live mode.

- **Presentation:** The endpoint shares a PPT document in this mode. When the video you are watching switches from one participant to another, the shared content remains unchangeable. In this mode, only one site can share content.
- **Live:** The endpoint shares active video images in Live mode. When the video you are watching switches from one participant to another, the shared content of the new participant is also displayed. In this mode, multiple sites can share content simultaneously.

In a multipoint conference, the chair can grant permission on sharing content to a specific site or the conference.

- After the content sharing permission is granted to a specific site, only the site can share content in the conference.
- After the content sharing permission is granted to the conference, all the sites are allowed to share content, but only one site can share content at a time.

5.9 Multi-Language User Interface

The endpoint supports multiple languages on its user interface (touch panel or remote control) and web interface.

- User interface (touch panel):
 - HUAWEI MediaPad T3 (version in China): Simplified Chinese, Traditional Chinese (Taiwan) and English.
 - HUAWEI MediaPad T3 (version outside China): English, Simplified Chinese, Arabic, Russian, Spanish (Europe), French (Europe), Traditional Chinese (Taiwan), Japanese, Portuguese (Brazil), and Thai
- User interface (remote control) and web interface: English, Simplified Chinese, German, Spanish (Europe), French (Europe), Norwegian, Italian, Polish, Russian, Portuguese (Europe), Portuguese (Brazil), Hungarian, Finnish, Romanian, Czech, Swedish, Arabic, Turkish, Greek, Thai, Japanese, Dutch, Indonesian, Malaysian, and Traditional Chinese (Taiwan)

The endpoint supports daylight saving time (DST) and flexible settings for the time format, time zone, and time. It allows users to customize time settings and displays the default format based on the user location.

5.10 Conference Recording

The RSE server can record conferences, including local conferences, conferences initiated using the built-in MCU, and conferences initiated using a standalone MCU. Explanations of conference recording in different scenarios are given below.

- Local conference

The RSE server's IP address is set on the endpoint, and neither the endpoint or the RSE server needs to be registered with a GK server.
- Multipoint conference hosted by SMC2.0

An SMC2.0 uniformly allocates RSE resources. The SMC2.0 sends RSE site information to the MCU, and the MCU adds the specified RSE to the conference to enable recording. Operations such as starting conference recording and configuring the RSE server can be performed on the SMC2.0. The SMC2.0 also supports automatic conference recording and automatic activation of the conference recording function.
- Multipoint conference directly initiated from the endpoint

The endpoint and RSE server need to be registered with a GK server. The URL or IP address of the RSE server needs to be configured on the endpoint. During a multipoint conference, the chair site and the site where the built-in MCU is used can perform recording operations.
- Multipoint conference hosted by a built-in MCU

Conferences are recorded by the RSE server without the participation of the MCU. Neither the endpoint or RSE server needs to be registered with a GK server. The endpoint adds the RSE server to the conference by calling the IP address of the RSE server, after which the RSE server allocates recording resources and completes the recording task. This mode is simple, flexible, and convenient.

5.11 Wi-Fi Connectivity

The endpoint has a built-in Wi-Fi module and is able to function as a Wi-Fi client, a Wi-Fi server, or both simultaneously. The maximum bandwidth is 54 Mbit/s and the frequency is 2.4 GHz.

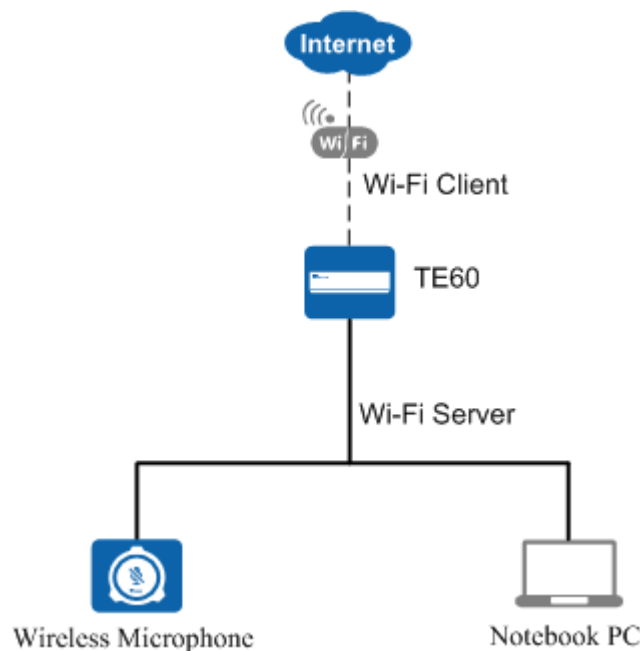
If the endpoint has the Wi-Fi client function enabled, it automatically detects and connects to Wi-Fi servers. You can set the endpoint IP address in DHCP or static mode. If a wired network deployment is not suitable, the endpoint can connect to the Internet through a wireless router. Therefore, the Wi-Fi client can be enabled when wired networks are unavailable and the endpoint needs to access networks through wireless routers.

If the endpoint has the Wi-Fi server function enabled, it can connect to three VPM220Ws (Huawei's wireless microphone array) through Wi-Fi, eliminating the need for physical connections.

If a user also purchases a wireless microphone or touch panel, the user can connect it to an endpoint through Wi-Fi to control the product.

Figure 5-8 shows the Wi-Fi network.

Figure 5-8 Wi-Fi network



5.12 Wireless Data Sharing

Three wireless data sharing clients are available: Air Content Sharing client, AirPresence PC client, and AirPresence mobile client.

- The Air Content Sharing client runs only on Windows PCs.
- The AirPresence PC client runs on Windows PC and Macs.
- The AirPresence mobile client runs on Android and iOS mobile devices.

The three wireless data sharing clients have the following features:

- All of them can connect to the endpoint over Wi-Fi or an IP network.
- You can enter the projection code on the AirPresence mobile client to connect it to the endpoint.

- The AirPresence mobile client supports document and picture sharing. If the operating system of the mobile device is Android 5.0 or later, the AirPresence mobile client also supports screen sharing.
- The Air Content Sharing client and AirPresence PC client support desktop sharing, including audio and video files played on PCs, documents, and pictures.

5.13 AirPresence Key

The AirPresence Key shown in [Figure 5-9](#) is a wireless content sharing device.

Connect the AirPresence Key to the USB port on the endpoint to pair them over Wi-Fi. After the pairing is complete, connect the AirPresence Key to the USB port on your PC, and then press the button on the AirPresence Key to start sharing the PC desktop.

You can use the Air Content Sharing PC client, AirPresence PC client, or AirPresence Key to share content in a conference. When a remote participant is sharing content, you can also start sharing. Then the remote sharing will stop. No matter which kind of client or device you want to use for content sharing, only one client or device can connect to the endpoint at a time.

Figure 5-9 AirPresence Key



5.14 Automatic Configuration Via a USB Device

The endpoint can automatically import its configuration files from a USB device, allowing a plug-and-play setup. The process is simple and efficient and no professional knowledge is required. The USB device that contains the configuration files can be obtained from agents or operators. When the configuration files are imported to the endpoint from the USB device, all configuration data is loaded automatically.

5.15 Startup Video Customization

The endpoint allows you to use the upgrade tool to replace the startup progress bar and Huawei logo with a custom video.

5.16 Custom Background Picture

When the endpoint is not in any conferences, local video is displayed on the connected screen by default. A custom background picture made using the upgrade tool can be configured to appear on the screen instead of local video.

5.17 Network Address Book

The network address book stores all site information. The administrator can import or export the address book and update the entries in batches using the web interface.

No matter whether the endpoint is located in on-premises, IMS hosted, or SP hosted networking scheme, it can access the LDAP address book through the corporate directory.

- If the network address book is stored on an FTP server, the endpoint automatically downloads and synchronizes site information from the FTP server upon startup. The administrator can also manually download or update the address book.
- If the network address book is stored on an LDAP or corporate directory server, the endpoint searches for sites from the LDAP or corporate directory server. The sites that are found on the LDAP server can be saved to the local address book, but the sites that are found on the corporate directory server cannot.

5.18 Real-time Viewing of HD Images

Using the remote video surveillance function, users can log in to the conference management web page to view the specified video source while the conference is going on. Both local and remote video can be viewed in real time, as shown in [Figure 5-10](#).

Figure 5-10 Viewing video



⚠ CAUTION

This function may lead to a breach of personal privacy. Ensure that its use complies with local laws and regulations.

5.19 Adaptation of and Conversion Between the 16:9 and 4:3 Display Modes

The endpoint can automatically detect monitors connected to it. The image ratio on the monitors varies with the video protocol and definition settings. If the local site needs to display the 4:3 video from a remote site on a monitor with a 16:9 LCD, the endpoint simply adjusts the video to prevent distortion.

5.20 VGA Bypass

A DVI-I port is required to enable VGA input and output for the TE60. When the endpoint is powered off, VGA images can be input from the DVI-I port and output from the DVI-I port through endpoint bypass. That means the image input and output is on the single VGA cable.

There are several scenarios during a conference:

- Connect the VGA output port of a PC to the VGA input port of a projector.
- Connect the VGA output port of a PC to the DVI-I port of the endpoint.

If your PC is connected to the endpoint (projector) but the (projector) endpoint is faulty, you have to unplug the VGA cable connected to the PC from the endpoint (projector) and connect the PC to the projector (endpoint) using the VGA cable. To address this trouble, the endpoint provides the VGA loopback function. To use this function, connect the VGA output port on the PC to the DVI-I input port on the endpoint and connect the DVI-I output port on the endpoint to the VGA input port on the projector. If the endpoint is faulty, it will function as an intermediary between the PC and the projector. You do not need to cope with the fault by plugging and unplugging cables.

5.21 Microphone Array Cascading

The VPM220, Huawei's homegrown wired microphone array, can connect to the endpoint and function as a sound pickup device. When the conference room is large and conference participants are scattered, three VPM220s can be cascaded to deliver optimal audio effects. The maximum distance between two cascaded VPM220s is 12 meters, and the suggested distance is 3 to 6 meters.

5.22 Seamless Convergence with IMS and USM

The endpoint can connect to the IMS hosted network (core component: IMS) or the SP hosted network (core component: USM) through the SIP protocol and then initiate or join HD video conferences to communicate with other clients and terminals.

5.23 Registering with the SC Using the Same SIP Number as the TE Desktop&TE Mobile

The TE60 can register with the same SC using the same SIP number as the TE Desktop&TE Mobile. However, only one of them can be online at a time. Users can choose to use the TE60 or TE Desktop&TE Mobile to join conferences based on their actual needs.

5.24 Interworking with the Lync System

Skype for Business (new-generation Lync client), Lync 2013, and Lync 2010 are corporate-level unified communications platforms released by Microsoft. Lync Online (a part of Office 365) is Microsoft's high-end cloud service as well as an application suite based on the cloud platform. This suite can deliver communications services by audio, video, and data to devices, such as PCs and smartphones. According to Microsoft's relevant protocols and processes, the endpoint preferentially uses the Lync gateway to communicate with the Lync system, including Skype for Business, Lync 2013/2010, and Lync Online (Office 365), to enable video communications at a resolution of up to 720p 30 fps. In some scenarios where the Lync gateway is not suitable, use the PXP Integrated Media Server. Enterprises that have the Lync platform deployed can access the videoconferencing system using devices, such as PCs, smartphones, and tablets.

5.25 Interconnection with the Videxio

To interconnect your endpoint with the Videxio platform, click the activation button on the Videxio web page and choose to automatically scan your endpoint or manually search for your endpoint by IP address. If the interconnection is successful, your endpoint also completes all required tasks, including getting activated, obtaining SIP settings, acquiring site names, and getting registered. After the interconnection, your endpoint can periodically obtain configuration data from the Videxio platform and join conferences initiated by the Videxio platform, delivering intelligent, cloud-based conferencing experience.

5.26 Interconnection with the ACS

The endpoint can be connected to the Auto-Configuration Server (ACS) and then is managed by the ACS through the TR-069 protocol. Various management operations are allowed, such as defining and querying system parameters, upgrading the endpoint, managing private and public networks, querying alarms, and collecting logs of the endpoint. Currently, the ACS can only be Huawei eSight, Huawei Terminal Management System (TMS), or China Mobile Device Management (DM) system.

5.27 Interconnection with the BroadSoft Platform

The endpoint can interconnect with the BroadSoft platform and then automatically obtain configuration data from this platform and complete the configuration process.

5.28 Interconnection with the DDNS

The endpoints can be connected to a third-party Dynamic Domain Name System (DDNS). After that, once any endpoint's IP address is changed, the DNS will immediately detect that change and find the new IP address based on the fixed domain name. In this way, the endpoints can be managed based on its domain name.

5.29 PSTN

The endpoint works with Public Switched Telephone Network (PSTN) phones and HD endpoints to establish hybrid networks, enabling all the devices to interwork with each other.

- The endpoint provides AAC-LD high-fidelity stereo audio.
- Using the MCU, sites that use PSTN phones and endpoints can join the same conference and communicate with each other.

NOTE

Currently, PSTN networking can be used only in mainland China.

5.30 4E1

The endpoint collaborates with the VP9650/VP9660 MCU to set up multipoint HD conferences through dedicated lines and support 4E1 access at a bandwidth of 8 Mbit/s.

- Conferences that provide 1080p or 720p video and AAC-LD high-fidelity stereo audio can be held, providing excellent HD conference quality.
- This network supports 2E1+2E1 backup solutions and intelligent control of the transmission rate on 4E1 lines, ensuring high reliability of the HD 4E1 network.
- Automatic HD 4E1+IP backup solutions are provided to ensure high reliability of HD conferences. When 4E1 lines are faulty, services running on the lines are automatically switched to IP lines.

5.31 Third-Party APIs

The endpoint provides HTTP-based third-party APIs to implement various functions, such as login authentication, conference setup, conference control, presentation sharing, address book, system configuration, and status query. Users can choose necessary APIs based on their actual needs to develop required functions and integrate them into other products or applications.

5.32 Network Adaptability

With powerful network adaptability, the endpoint provides smooth, sharp HD video even in the case of unstable network conditions and low bandwidth.

- The endpoint supports H.264 SVC and is adaptable to different bandwidths, device capabilities, and network requirements.

- Patented Super Error Concealment (SEC) ensures high-quality video experiences even with packet loss at 20%.
- The AEC, automatic gain control (AGC), and ANS technologies and the AAC-LD standard ensure clear and smooth audio quality even with packet loss at 20%.
- Huawei's Intelligent Rate Control (IRC) technology automatically detects network service bandwidth occupation and intelligently selects the optimal resolution based on the bandwidth to ensure conference quality.

5.33 Security

The endpoint provides a variety of security features, including system layer security, network layer security, firewall technology (NAT), secure public-private network traversal, network diagnostics, web request authentication, protocol anti-attack measures, protection of sensitive data, and system management and maintenance security.

System Layer Security

Security maintenance of the system layer ensures a smooth running of the operating system and also supports stable services at the application layer. The endpoint uses Linux, which is more secure and immune to viruses than Windows.

Network Layer Security

The on-premises, IMS hosted, and SP hosted networks have implemented different network layer security policies.

- On-premises network:
 - The endpoint, SMC2.0, and MCU are deployed in the trusted zone, isolated from the Demilitarized Zone (DMZ) and the untrusted zone. Firewalls are deployed for security domain division and access control.
 - Terminals (such as TE Desktop and TE Mobile) in the untrusted zone communicate with NEs in the trusted zone through the Session Border Controller (SBC) or Switch Center (SC) in the DMZ.
- IMS hosted and SP hosted networks:
 - The endpoint is deployed in the untrusted zone, isolated from the DMZ and the trusted zone through the SBC or the extranet firewall.
 - If the DMZ is deployed, install the SBC, SC, USM Proxy, and MediaX Proxy in the DMZ for endpoint connections.
 - If no DMZ is deployed, the endpoint connects to the trusted zone through the SBC. The USM Proxy and MediaX Proxy are not required.
 - On network borders between the DMZ and the trusted and untrusted zones, firewalls are deployed to implement security domain division and access control.

Firewall Technology (NAT)

The firewall protects your IP network by separating the internal and external network communication data. Using Network Address Translation (NAT) technology and exchanging signaling between public network protocols and private network protocols, the firewall enables sites on local area networks (LANs) in different places to enjoy the convenience of communication through video conferences. With NAT, a device on an LAN is allocated a

dedicated internal IP address that uniquely identifies the device on the LAN, and the device uses an external IP address to communicate with external devices. Through NAT mapping, multiple internal IP addresses are mapped to one external IP address. NAT mapping not only reduces the number of IP addresses that are needed for users on a private network to access the Internet, but also enhances the security of the private network.

Secure Public-Private Network Traversal

The standard H.460, SIP Interactive Connectivity Establishment (ICE), and exclusive Super Network Passport (SNP) firewall traversal technologies are used to set up secure connections between the public and private networks or between different private networks through firewalls.

Network Diagnostics

To ensure superb audio and video, you can use the diagnostic tool released with the endpoint software version to check the network performance, including:

- Connectivity
- Route information
- Bandwidth
- Whether required ports are blocked by firewalls and whether the destination ports are enabled
- Network quality indexes, including QoS, latency, jitter, packet loss rate, and out-of-order rate
- NAT device type
- Whether the changes that the ALG has made for H.323 and SIP messages are correct

To start network diagnostics, connect the diagnostic tool to the endpoint. To set up the connection, the user name and password are required, which are encrypted and then transmitted to the endpoint.

Web Request Authentication

- When a user requests access to a specified web page or submits a servlet request, the endpoint checks whether the user's session identifier is valid and whether the user is authorized to perform the operation.
- The server implements the final authentication on the user.
- Before transmitting user-generated data to clients, the server verifies the data and encodes it using HyperText Markup Language (HTML) to prevent malicious code and cross-site scripting attacks.
- Web security software is used to scan the web server and applications to ensure that there are no high-risk vulnerabilities.

Protocol Anti-Attack Measures

- The communication matrix is provided in the product documentation. Do not enable the services and ports that are not mentioned in the communication matrix.
The communication port matrix contains the following information: open ports, transport layer protocols used by the ports, network elements (NEs) that use the ports to communicate with peer NEs, application layer protocols used by the ports and description of the services at the application layer, whether services at the application

layer can be disabled, authentication modes adopted by the ports, and port functions (such as data traffic control).

- The endpoint utilizes multiple encryption measures, including H.235 (for encryption of media and signaling streams), Secure Real-time Transport Protocol (SRTP), Transport Layer Security (TLS), and Hypertext Transfer Protocol Secure (HTTPS), to ensure secure and stable running of the videoconferencing system.
- For network management, the endpoint supports the Simple Network Management Protocol v3 (SNMP v3), which features higher adaptability and security. User names are needed to connect the network management system to the endpoint.
- Robustness testing tools are used to scan protocols to ensure that there are no high-risk vulnerabilities.
- By default, the File Transfer Protocol over SSL (FTPS) and LDAP over SSL (LDAPS) are used to encrypt the address book, ensuring data integrity and preventing data from being stolen.

Protection of Sensitive Data

- The log, diagnostic, debug, and alarm information must not contain sensitive data.
- Sensitive data must be transmitted through secure channels or transmitted after being encrypted.
- To prevent sensitive data from being disclosed, the endpoint checks the complexity of the password. A password is displayed as "." or "*" when entered in the password input box, and the entered password cannot be copied.
- Sensitive data such as passwords and ciphering context must not be recorded in logs. If sensitive data really needs to be recorded, it should be displayed as "****".
- Standard encryption algorithms (proprietary algorithms not allowed) and key negotiation mechanisms are used.

System Management and Maintenance Security

- Software packages (including patches) are released only after they are scanned by at least five types of mainstream antivirus software and no alarm is generated. Explanations are provided for alarms under special circumstances.
- All user operations and system abnormalities are recorded into logs.

6 Operation and Maintenance

6.1 Using the Touch Panel

The endpoint provides an optional Android-based, 10-inch touch panel. With an intuitive and customized UI, the touch panel provides a superb gesture control experience, allowing users quick access to conference functions.

On the touch panel UI, you can perform operations such as finding a scheduled conference and joining it simply by one tap, creating a point-to-point or multipoint conference, sharing presentation, viewing a specified site or presentation, setting continuous presence, performing conference control, defining system settings, conducting a diagnosis simply by one tap, selecting and configuring the VPT300, and controlling microphones, speakers, and cameras. If the Far-End Camera Control (FECC) function is enabled for a remote camera during a conference, you can also use the touch panel to control the remote camera. [Figure 6-1](#) shows the home screen of the touch panel UI.

Figure 6-1 Home screen of the touch panel UI

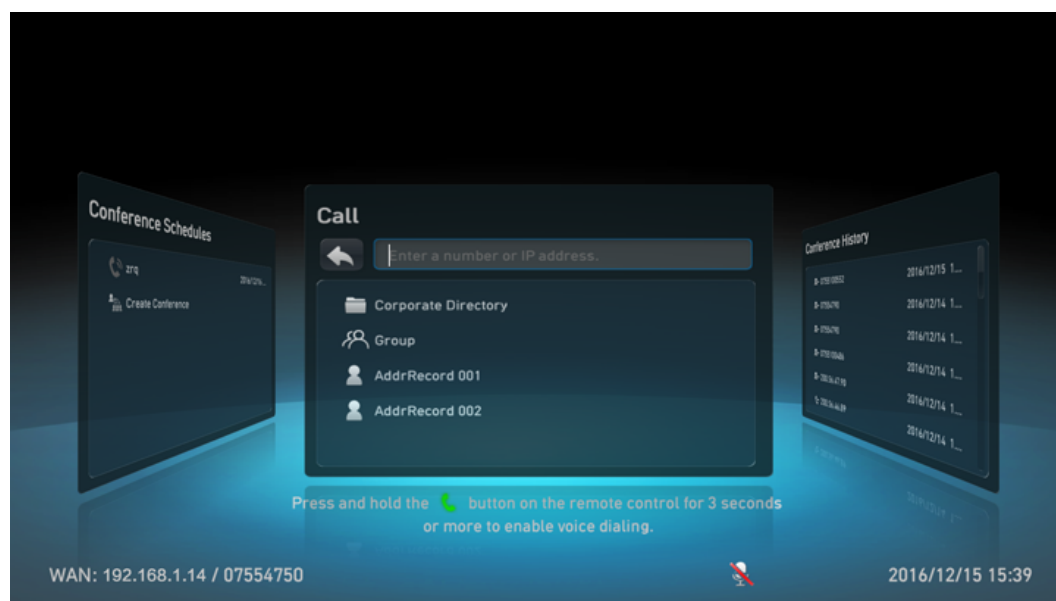


6.2 Using the Remote Control

A remote control is provided to allow convenient operations for users. The remote control UI adopts the "what you see is what you get" design, which is easy to understand and use.

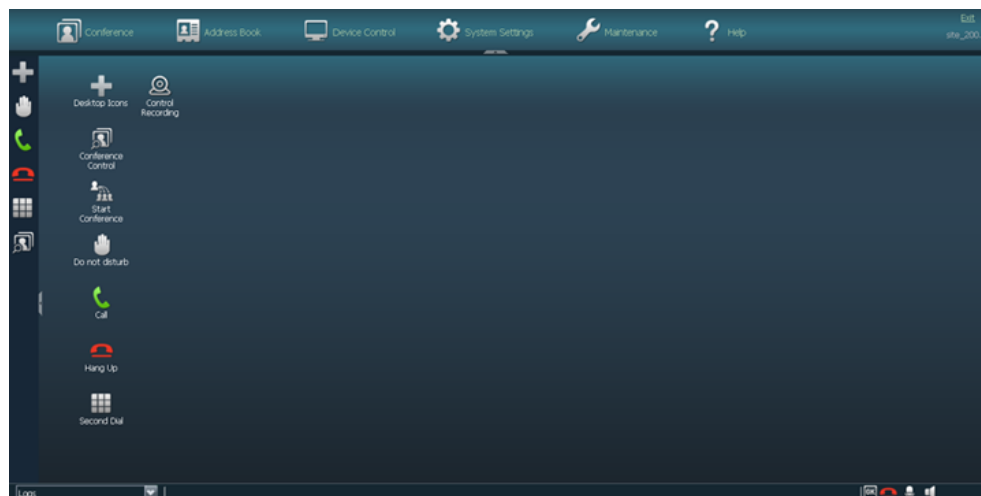
Using the remote control, users can perform various operations, such as initiating a conference, making a voice call, controlling a conference, controlling captions, modifying system configurations, controlling the microphones and speakers, and selecting and controlling cameras. [Figure 6-2](#) shows the home screen of the remote control UI.

Figure 6-2 Home screen of the remote control UI



6.3 Using the Web Interface

Web-based management is supported, which allows users to initiate calls, control conferences, save address books, and modify system configurations. Users in different locations can concurrently access and use the endpoint through the web interface, which eliminates the restriction of space. The administrator can also control the endpoint remotely using its web interface. The web interface supports concurrent operations by a maximum of 10 users (including API users). The same user name and password can be used by multiple users. When multiple users perform operations on the web interface, the last operation takes effect. [Figure 6-3](#) shows the home page of the web interface.

Figure 6-3 Home page of the web interface

6.4 Log Management

Operation and error logs are recorded for the endpoint, helping users maintain the system and locate faults.

Logs are saved as files in the endpoint. Users can query historical logs either on the web interface or using the remote control. Querying logs of the specified date is supported. Using the web interface, users can export logs as files to the local PC for detailed analysis, or delete all historical logs. If you use the touch panel, you can query its logs.

6.5 Inspection

- The SMC can automatically perform the following inspection tasks on the endpoint:
 - Check the status of IP and 4E1 lines.
 - Check the system software version, CPU, memory, temperature, and fan.
 - Check the H.323 and SIP registration status.
 - Conduct a diagnosis on local audio and video loopback.
 - Continue inspection after the endpoint restarts or ends a call.
 - Stop inspection anytime.
 - Receive the inspection status and result.
- The Versatile Tools Suite (VTS) collects the information about the network status, system status, connection status, hardware running status, and faults of the endpoint.

6.6 CHR Collection

CHR collection is unsupported when the built-in MCU of the endpoint is functioning.

After connecting to eSight, the endpoint periodically sends its session and media CHR data files to eSight. The SessionInsight obtains the files from eSight and analyzes them to quickly

locate faults. For the endpoint, CHR data files can also be exported offline and then manually imported into the SessionInsight for analysis.

6.7 System Upgrade

The endpoint can be upgraded automatically or manually. By upgrading the system software of the endpoint to the latest version, users can enjoy enhanced and the latest features and functions.

Manual upgrade: Users use the upgrade tool to initiate the system upgrade. They can also upgrade the system on the web interface.

Automatic upgrade: The endpoint automatically triggers a system upgrade at the interval specified by users.

The VPT300 and its two auxiliary VPC600s can be upgraded using a specific tool.

The touch panel can be upgraded through the endpoint or manually upgraded.

The endpoint connected to the ACS can be upgraded using the ACS.

As a manageable device of the SMC2.0, the endpoint can be upgraded using the SMC2.0. If multiple endpoints exist, they can be upgraded in batches from the SMC2.0.

6.8 Disaster Recovery

On the IMS hosted and SP hosted network, two EUAs are deployed in active/standby mode. If the endpoint fails to connect to the active EUA, it automatically switches to the standby EUA for obtaining required information.

7 Technical Specifications

7.1 Physical Specifications

[Table 7-1](#) lists the physical specifications.

Table 7-1 Physical specifications

Item	Specifications
Electricity supply requirements	
Power supply	100 V AC to 240 V AC; 50 Hz to 60 Hz
Maximum power consumption	150 W
Environment requirements (operating state)	
Ambient temperature	0°C to 40°C (32°F to 104°F)
Relative humidity	10% to 90%
Ambient noise	< 46 dBA SPL
EMC	CLASS A
Altitude	< 5 km
Environment requirements (non-operating state)	
Ambient temperature	- 40°C to +70°C (-40°F to 158°F)
Relative humidity (non-condensing)	10% to 90%
Dimensions and weight	

Item	Specifications
Dimensions (H x W x D)	72.5 mm x 435 mm x 265.5 mm (2.85 in. x 17.13 in. x 10.45 in.)
Net weight	4.6 kg (10.14 lb)
Wi-Fi features	
Technical standard	IEEE 802.11 b/g/n
Working frequency band	2400 MHz to 2483.5 MHz
Maximum transmit power	<20 dBm

7.2 Performance and Capacity

Table 7-2 lists the endpoint performance and capacity specifications.

Table 7-2 Performance and capacity

Item	Specifications
Call bandwidth (IP)	64 kbit/s-8 Mbit/s
Call bandwidth (4E1, only TE60)	64 kbit/s-8 Mbit/s
Video resolution	<ul style="list-style-type: none">● 1080p 60 fps with a minimum bandwidth of 1 Mbit/s (optional)● 1080p 30 fps with a minimum bandwidth of 512 kbit/s● 720p 60 fps with a minimum bandwidth of 512 kbit/s● 720p 30 fps with a minimum bandwidth of 384 kbit/s● 4SIF/4CIF with a minimum bandwidth of 128 kbit/s● SIF/CIF/SQSIF/SQCIF/QSIF/QCIF with a minimum bandwidth of 64 kbit/s


Item	Specifications
Presentation resolution	<ul style="list-style-type: none"> ● Input: VGA (640 x 480) 60/72/75/85 fps, SVGA (800 x 600) 56/60/72/75/85 fps, XGA (1024 x 768) 60/70/75/85 fps, 1152 x 864 60/75/85 fps, 1280 x 600 60 fps, WXGA (1280 x 768) 60/75/85 fps, WXGA (1280 x 800) 60/75/85 fps, 1280 x 960 60/75/85 fps, SXGA (1280 x 1024) 60/75/85 fps, 1360 x 768 60 fps, 1366 x 768 60 fps, 1440 x 900 60 fps, SXGA+ (1400 x 1050) 60 fps, 720p 60/75/85 fps, 1080p 60 fps, 1600 x 900 60 fps, 1600 x 1200 60 fps, 1680 x 1050 60 fps, 1920 x 1200 60 fps ● Output: 1600 x 1200, 1920 x 1200, 1920 x 1080, 1280 x 1024, 1280 x 720, 1024 x 768, 800 x 600 ● Coding/Decoding resolution: 1600 x 1200, 1920 x 1200, 1920 x 1080, 1280 x 1024, 1280 x 720, 1024 x 768, 800 x 600
Dual-stream (video + presentation) capability	1080p 60 fps for both video and presentation
AirPresence mobile client	<p>How to download:</p> <ul style="list-style-type: none"> ● For Android smartphone or tablet users, search for AirPresence in Huawei HiApp or Google Play. ● For iPhone or iPad users, search for AirPresence in App Store. ● You can also obtain the installation file from the endpoint software package. <p>Operating system and hardware:</p> <ul style="list-style-type: none"> ● Android 4.0 or later, CPU with the ARMv7 Neon chip or above, dominant frequency of 1.5 GHz or above, memory of 1 GB or above iOS 7.0 - 11.1 on iPhone 7 Plus, iPhone 7, iPhone 6s Plus, iPhone 6s, iPhone 6 Plus, iPhone 6, iPhone SE, iPhone 5s, iPhone 5c, and iPhone 5 <p>Presentation sharing:</p> <ul style="list-style-type: none"> ● The AirPresence mobile client on Android supports PDF files and PNG, JPG and BMP images. ● The AirPresence mobile client on iOS supports PDF, Word, Excel, and PPT files and PNG, JPG and BMP images. ● On the AirPresence mobile client, the document to share cannot exceed 30 MB, and the image to share cannot exceed 8 MB. ● The screens of mobile phones running Android 5.0 or later can be shared at a resolution of 720p 10 fps.

Item	Specifications
AirPresence PC client	Obtain the installation file from the endpoint software package. Operating system and hardware: <ul style="list-style-type: none">● 32-bit Windows XP, 32-bit or 64-bit Windows 7, 8, 8.1 or 10● 32-bit and 64-bit macOS 10.7 to 10.11 Presentation sharing: <ul style="list-style-type: none">● Maximum resolution: 720 and 1024 x 768● Maximum frame rate: 15 fps
Air Content Sharing Client	How to download: Download client from the endpoint's web interface. Operating system and hardware: <ul style="list-style-type: none">● 32-bit and 64-bit Windows Vista, Windows 7● 32-bit and 64-bit Windows XP Presentation sharing: <ul style="list-style-type: none">● Maximum resolution: 720 and 1024 x 768● Maximum frame rate: 15 fps
Other video features	<ul style="list-style-type: none">● Video Motion Enhancement● VideoIntensifier● ViewProcessing● Super Error Concealment
Audio features	AEC, ANS, AGC, VoiceClear, AudioEnhancer, and lip synchronization
Built-in MCU capability	Maximum number of connected sites: <ul style="list-style-type: none">● Non-encrypted conference: nine 720p 30 fps video sites (local site included) and three audio-only sites● Encrypted conference: nine 720p 30 fps video sites (local site included) Maximum bandwidth: 8 Mbit/s (1 Mbit/s for each video site) Continuous presence per port: supports a maximum of 10 video panes
Wi-Fi features	54 Mbit/s transmission bandwidth at the frequency of 2.4 GHz

7.3 Ports and Protocols

[Table 7-3](#) lists the ports and protocols of the endpoint.

Table 7-3 Port description

Port	Description and Quantity	Standards and Protocols Compliance	Remarks
Video input	<ul style="list-style-type: none"> ● 1 x HDMI/DVI (audio input supported) ● 2 x DVI-I (HDMI, VGA, and YPbPr supported with conversion cables) ● 2 x HD-VI/DVI ● 1 x CVBS/S-VIDEO (converted from a DVI-I port) ● 1 x 3G-SDI 	<ul style="list-style-type: none"> ● DVI1.0 VESA 	<ul style="list-style-type: none"> ● The HD-VI port is used to connect to a VPC600 or VPC620. ● The VPT300 can be connected using the HD-VI video input port. ● The 3G-SDI port is connected to Huawei's coaxial cable to support a maximum transmission distance of 60 m.
Video output	<ul style="list-style-type: none"> ● 2 x HDMI/DVI (audio output supported) ● 2 x DVI-I (HDMI, VGA, and YPbPr supported with conversion cables) ● 1 x CVBS/S-VIDEO (converted from a DVI-I port) ● 1 x 3G-SDI 	HDMI 1.3	The 3G-SDI port is connected to Huawei's coaxial cable to support a maximum transmission distance of 60 m.
Audio input	<ul style="list-style-type: none"> ● 2 x XLR ● 2 x RCA ● 1 x HDMI ● 1 x HD-AI 	-	-
Audio output	<ul style="list-style-type: none"> ● 4 x RCA ● 2 x HDMI ● 2 x DVI-I (with the use of a DVI-HDMI cable) 	-	-
USB port	2 x USB 2.0	USB 2.0	-

Port	Description and Quantity	Standards and Protocols Compliance	Remarks
Network port	<ul style="list-style-type: none"> ● 2 x 10/100/1000 Mbit/s LAN ● 1 x Wi-Fi (built-in) ● 1 x 4E1 (optional) ● 1 x PSTN 	-	Currently, the PSTN port can be used in China only.
Serial port	2 x RS232	-	-
Infrared remote control port	Infrared signal reception	NEC	Control using IR capable cameras.

7.4 Standards Compliance

Table 7-4 lists the standards that the endpoint complies with.

Table 7-4 Standards compliance

Item	Specifications
Video encoding and decoding protocols	H.264 SVC, H.264 HP, H.264 BP, H.263, H.263+, and RTV
Audio encoding and decoding protocols	AAC-LD, G.711A, G.711U, G.719, G.722, G.728, G.729A, HWA-LD, G.722.1, and G.722.1C
Multimedia frame protocols	ITU-T H.323 and IETF SIP
Dual-stream standard	ITU-T H.239 and BFCP
Network transmission protocols	TCP/IP, RTP, RTCP, FTP, DHCP, SNMP, Telnet, HTTP, SSH, HTTPS, PPPoE, SNTP and TR-069
Other communications protocols	H.225, H.235, H.241, H.245, H.281, H.350, H.460, T.140, RFC2833, and DTMF
IP protocol	IPv4 and IPv6 dual stack
Wi-Fi	IEEE 802.11 b/g/n WEP, WPA, WPA2, and WPS authentication
Protocol for signaling and media stream encryption	H.235, TLS, and SRTP

Item	Specifications
H.323 Far-End Camera Control (FECC)	H.281 and H.224

A Glossary

Numerics

4CIF 4 x Common Intermediate Format
A video resolution of 704 x 576 pixels.

4SIF 4 x Source Input Format.
A video format with a resolution of 704 x 480 pixels and using progressive scanning.

A

AAC advanced audio coding

API Application Programming Interface
An application programming interface is a particular set of rules and specifications that are used for communication between software programs.

AutoFrame Based on the number, location, and motion of participants, this function automatically adjusts the camera to provide a dynamic overview of the full room.

B

built-in MCU A built-in unit of an endpoint, by using the built-in MCU, the endpoint can hold a multipoint conference that supports multiple functions, such as site access, video exchange, audio mixing, data processing, and signaling interaction.

C

CHR Call History Record

CIF Common Intermediate Format

CSCF Call Session Control Function
The core component of the IMS network. It performs the functions such as registration, authentication, session control, service triggering, topology hiding, QoS control, NAT traversal, and security management.

camera	A device for recording visual images in the form of photographs, movie film, or video signals.
chair site	A site that has chair control rights.
D	
DMZ	<p>Demilitarized Zone</p> <p>A buffer area between an insecure system and the secure system and is used to solve the problem that the external network equipped with a firewall cannot access the internal network server. The DMZ is located between the internal network and the external network. In the DMZ, some public server facilities, such as the enterprise Web server and FTP server, can be located. The DMZ effectively protects the internal network.</p>
DNS	<p>Domain Name System</p> <p>A mechanism of mapping easy-to-remember domain names to IP addresses recognizable for network devices.</p>
DST	Daylight Saving Time
DTMF	<p>Dual Tone Multiple Frequency</p> <p>Multi-frequency signaling technology for telephone systems. According to this technology, standard set combinations of two specific voice band frequencies, one from a group of four low frequencies and the other from a group of four high frequencies, are used.</p>
E	
EUA	<p>Enterprise Unified Address Book</p> <p>A next-generation address book server launched by Huawei. It provides LDAP-based unified address book services for Huawei videoconferencing and enterprise communication solutions.</p>
G	
G.722	Audio codec standard that uses adaptive differential pulse-code modulation (ADPCM). Its data rate is 48 kbit/s, 56 kbit/s, or 64 kbit/s.
G.728	Audio codec standard that uses low-delay code excited linear prediction (LD-CELP). Its data rate is 16 kbit/s.
H	
H.239	A standard recommended by ITU-T. It enables a video conference to have simultaneous transmission of both video and data content (for example, computer desktop).
H.263	A video codec standard for video conferences at low rates. Five formats are available, SQCIF, QCIF, CIF, 4CIF, and 16CIF.
H.264	Compared with H.263, H.264 can provide the same-quality video at half of the bit rate, with strong error resilience characteristics.

H.323 protocol	A communication control protocol defined by the International Telecommunication Union (ITU). It offers multimedia services in the packet-switched (PS) network. Call control is an essential component in H.323 and is used to establish point-to-point media sessions and multi-point media conferences.
HD	high definition
HD display	An HD plasma TV that is used to display the video from a telepresence codec.
HDMI	high definition multimedia interface
HEVC	High Efficiency Video Coding High Efficiency Video Coding, also known as H.265, is a next-generation digital video compression format developed by the ITU-T Video Coding Experts Group (VCEG) together with the ISO/IEC JTC1 Moving Picture Experts Group (MPEG). Compared with its previous generation (H.264), HEVC offers a higher data compression ratio.
I	
ICE	intelligent concept extraction
IMS	IP multimedia subsystem
L	
LDAP	Lightweight Directory Access Protocol A network protocol based on TCP/IP, which allows access to a directory system agent (DSA). It involves some reduced functionality from X.500 Directory Access Protocol (DAP) specifications.
M	
multipoint call	A site makes calls to multiple sites, to hold a conference that has multiple participants.
P	
PPPoE	Point-to-Point Protocol over Ethernet
PiP	Picture-in-Picture
point-to-point call	A site makes a call to another site, to hold a conference that has two participants.
presentation	During a conference, the local site shares the content input from a computer with remote sites, such as an excel file, a diagram, or slides.
R	
RSE	Recording & Streaming Engine
S	
S/PDIF	Sony/Philips Digital Interface Format

SBC	session border controller
SD	Standard Definition A video format with the resolution below 720p.
SIF	Source Input Format
SIP URI	It is used for SIP to identify users. A SIP URI includes a user name and a domain name. It can also contain other parameters.
SIP trunk	A packet trunk. Different from a physical channel defined by a circuit relay, a SIP trunk defines a logical channel, which solves the issues about interoperability authentication and call addressing between the local office and the peer office.
SMC	Service Management Center A videoconferencing service management system that manages videoconferencing devices (including GKs, MCUs, and participant endpoints) and allocates videoconferencing resources.
SP	Service Provider A service provider (SP) is defined as a company or organization, making use of an electronics communications network or part thereof to provide a service or services on a commercial basis to third parties.
S RTP	Secure Real-time Transport Protocol A real time transport protocol with enhanced security and encryption mechanism-based RTP.
SSH	Secure Shell A set of standards and an associated network protocol that allows establishing a secure channel between a local and a remote computer. A feature to protect information and provide powerful authentication function for a network when a user logs in to the network through an insecure network. It prevents IP addresses from being deceived and simple passwords from being captured.
STUN	Simple Traversal of UDP through NAT
Switch Center	A Switch Center (SC) is Huawei's new-generation network switch system that provides H.323 GK, SIP server, and media proxy functions.
T	
TCP/IP	Transmission Control Protocol/Internet Protocol
TLS	Transport Layer Security
TMS	terminal management system
touch panel	The touch panel is connected to the telepresence system wirelessly. Without cable restriction, users can use the touch panel conveniently. From the touch panel, users can perform operations, such as dialing a number, calling a contact, answering or rejecting a call, controlling a conference, and switching the display mode.

V

VGA Video Graphics Array

W

WPA Wi-Fi Protected Access

A wireless security protocol replacing WEP and aiming to provide more powerful security performance for the IEEE 802.11 WLAN. WPA is a subset of IEEE 802.11i, whose core is IEEE 802.1x and TKIP.

Wi-Fi Wireless Fidelity

A short-distant wireless transmission technology. It enables wireless access to the Internet within a range of hundreds of feet wide.

X

XGA Extended Graphics Array